AD-A191 214 AUTOANALYZER SUPPORT FOR USNS LYNCH CRUISE 702-88(U) 1/1
TEXAS A AND M UNIV COLLEGE STATION DEPT OF OCEANOGRAPHY
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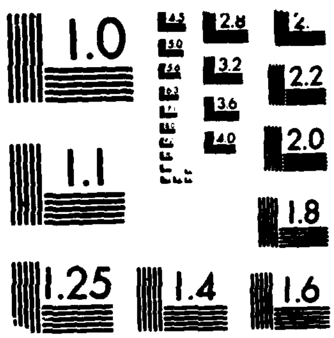

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Two Marine Technicians from the Technical Support Services group of the Department of Oceanography at Texas A&M University provided on board autoanalyzer analyses for nitrate, nitrite, phosphate, and silicate on seawater samples collected during Operation DEJA VU, cruise 702-88 of the USNS LYNCH (14 November - 2 December 1987).

838 samples from 33 CTD stations were analyzed on board with a Technicon model AA-II four-channel autoanalyzer provided by Texas A&M University.

Douglas C. Biggs @ TAMU

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SUMMARY OF TECHNICAL SUPPORT SERVICES PROVIDED

Marine Technicians Mark Spears and Glenn Casey of the Department of Oceanography at Texas A&M University flew from Houston, Texas, to Rota, Spain, on 7 November 1987 to provide autoanalyzer support for USNS LYNCH cruise 702-88. Organized by scientists from the Oceanography division of NORDA at Bay St. Louis, Mississippi, this cruise investigated ocean frontal processes in the western Mediterranean Sea, with emphasis on the Almeria and Oran fronts.

Pre-cruise staging and other preparation began in Rota 8 November, and LYNCH embarked Rota on 14 November. From 15 November - 1 December, 41 CTD stations were occupied and four-channel autoanalyzer nutrient analyses were run at 33 of these. Duplicate water samples for analysis of silicate, phosphate, nitrate, and nitrite were drawn at a series of depths from the sample stream from a submersible pump attached to the CTD. Autoanalyzer sampling generally began around 120m and proceeded at roughly 10m intervals to the surface. In all, 419 pairs of water samples were analyzed for nutrients on board LYNCH during cruise 702-88.

SUMMARY OF ANALYTICAL TECHNIQUES

The autoanalyzer used to support LYNCH cruise 702-88 was a 4-channel Technicon AA-II, which was standardized by running 2-3 working standards of all four nutrients prior to and after each station. All samples were analyzed within two hours of collection; analysis rate was 20 samples per hour. Peak heights picked off the strip chart recorder output of each autoanalyzer channel were converted to nutrient concentration in ug-at/liter by linear interpolation from absorbance relative to the working standards, using a shipboard computer.

Silicate was determined by ammonium molybdate + tartaric acid + stannous chloride method; phosphate by ammonium molybdate + hydrazine method; and nitrate by sulfanilamide + NEDA method, after reduction to nitrite with a cadmium reduction column. All analyses except phosphate, which was heated in a 70 C bath, were carried out at room temperature. Colorimeter interference filters utilized were 660 nm (silicate), 880 nm (phosphate) and 550 nm (nitrate + nitrite).

To evaluate precision and accuracy of the analytical methods, 15 replicate analyses of each of the highest working standards were run after completing the last station of the cruise. The standard deviation in ug-at/liter for a 6.0 ug-at/liter silicate standard was 0.05 (cv=1%); 0.005 for a 0.50 ug-at/liter phosphate standard (cv= 1%); 0.05 for a 6.5 ug-at/liter nitrate standard (cv=1%); and 0.005 for a 0.50 ug-at/liter nitrite standard (cv=1%).

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PHYSICAL DATA

CRUISE 87L88 STATION B87L88*01*1

WIRE LENGTH METERS	PO4 um/l	Si(OH)4 um/l	NO3 um/l	NO2 um/l
110	.21	5.80	8.91	100.
100	.21	5.30	[illegible]	100.
80	.18	3.60	6.60	.02
70	.16	3.00	[illegible]	.12
60	.12	2.40	5.70	.12
50	.10	1.60	4.13	.19
45	.10	2.20	3.43	.19
40	.05	.50	.53	.03
30	100.	.30	.26	.02
20	.01	.20	.42	.02
10	.02	.10	.65	.01
3	100.	0.00	.40	100.

CRUISE 87L88 STATION B87L88*02*1

WIRE LENGTH METERS	PO4 um/l	Si(OH)4 um/l	NO3 um/l	NO2 um/l
100	.22	5.10	8.69	.05
90	.22	4.90	8.20	.04
80	.19	4.10	7.24	.05
70	.18	3.60	7.19	.04
60	.17	2.90	5.64	.14
50	.04	.80	1.01	.07
40	.01	.30	.20	.03
30	.01	.20	.20	.01
20	100.	.10	.10	.02
10	.01	.10	[illegible]	.02
0	.03	.20	.77	.03

CRUISE 87L88 STATION B87L88*03*1

WIRE LENGTH METERS	P04 uM/l	Si(OH)4 uM/l	NO3 uM/l	NO2 uM/l
90	.24	2.50	5.12	.05
80	.21	1.70	4.49	.05
70	.19	1.60	3.93	.07
60	.12	.90	2.60	.03
55	.10	.90	2.08	.05
50	.07	.70	1.89	.05
45	.06	.80	1.63	.03
40	.06	1.00	1.56	.03
32	.04	.70	1.58	.02
20	.02	.30	1.45	.01
10	.02	.30	1.37	.01
0	.02	.10	1.24	100.

CRUISE 87L88 STATION B87L88*04*1

WIRE LENGTH METERS	P04 um/l	Si(OH)4 um/l	NO3 um/l	NO2 um/l
100	.29	3.80	7.24	100.
90	.37	5.00	8.66	100.
80	.35	4.80	8.42	100.
70	.32	4.10	7.55	100.
60	.25	2.70	5.53	100.
50	.20	2.00	4.47	.02
45	.16	3.30	3.41	.16
40	.13	1.20	2.61	.19
30	.01	.10	.12	.14
20	.01	.10	.64	100.
10	.02	.20	.33	100.
0	.01	.20	.30	100.

CRUISE 87L88 STATION 887L88*05*1

WIRE LENGTH METERS	PO4 um/l	Si(OH)4 um/l	NO3 um/l	NO2 um/l
100	.30	6.00	8.61	100.
80	.22	4.60	7.01	100.
70	.29	4.40	6.40	.12
60	.24	4.00	5.53	.24
55	.16	2.80	4.33	.44
50	.19	2.60	3.80	.43
45	.05	1.10	.48	.17
40	.01	.80	.09	.04
30	.08	.70	.18	.06
20	.02	.80	.27	.07
10	.01	.70	.09	.08
0	.03	.80	.04	.18

CRUISE 87L88 STATION 887L88*06*1

WIRE LENGTH METERS	PO4 um/l	Si(OH)4 um/l	NO3 um/l	NO2 um/l
100	.35	3.20	8.70	100.
80	.33	2.50	7.68	.01
70	.46	2.20	6.92	.02
60	.32	2.00	6.44	.02
50	.26	1.50	5.68	.09
40	.20	1.20	4.49	.25
35	.20	1.30	4.64	.09
30	.09	.50	1.96	.30
25	100.	99.99	.05	.02
20	100.	99.99	99.99	100.
10	100.	.10	.24	100.
0	.02	.10	.25	.01

CRUISE 87L88 STATION B87L88*07*1

WIRE LENGTH METERS	PO4 um/l	Si(OH)4 um/l	NO3 um/l	NO2 um/l
95	.33	3.90	8.36	.01
80	.31	3.10	7.39	.02
70	.26	2.10	5.98	.11
60	.24	2.30	5.47	.15
50	.10	1.10	1.98	.21
40	.06	.80	1.14	.17
35	.03	.60	.72	.12
30	.04	.50	.69	.11
25	.02	.50	.52	.08
20	100.	.40	.21	.03
10	100.	99.99	99.99	100.
0	100.	99.99	99.99	100.

CRUISE 87L88 STATION B87L88*15*1

WIRE LENGTH METERS	PO4 um/l	Si(OH)4 um/l	NO3 um/l	NO2 um/l
100	.23	1.50	4.94	.03
90	.21	1.60	4.32	.05
80	.14	1.00	2.74	.05
70	.11	.80	2.10	.07
60	.07	.60	1.00	.37
50	.01	.30	.05	.20
40	.01	.10	99.99	.01
30	100.	.10	99.99	100.
20	100.	.10	99.99	100.
10	100.	.10	.17	100.
0	100.	99.99	.31	100.

CRUISE 87L88 STATION B87L88*16*1

WIRE LENGTH METERS	PO4 um/l	Si(OH)4 um/l	NO3 um/l	NO2 um/l
97	.30	3.40	7.16	.03
90	.24	2.60	4.81	.07
80	.27	2.90	5.54	.10
70	.04	.80	.22	.19
60	.01	.60	.01	.06
50	.01	.40	.06	.05
40	.01	.40	.06	.05
30	.02	.50	.06	.06
20	.01	.30	.01	.05
10	100.	99.99	.09	100.
0	.01	.30	.44	100.

CRUISE 87L88 STATION B87L88*17*1

WIRE LENGTH METERS	PO4 um/l	Si(OH)4 um/l	NO3 um/l	NO2 um/l
100	.09	2.50	2.90	.04
90	.13	1.50	3.73	.14
85	.14	1.40	3.55	.20
80	.20	2.00	4.74	.26
70	.07	1.20	1.39	.27
60	.05	.90	.78	.50
50	.02	.50	.24	.52
40	.01	.10	.04	.03
30	.01	.10	.04	.02
20	.02	.10	.12	.02
10	.01	.10	.04	.01
0	.01	.10	.05	.01

CRUISE 87L88 STATION B87L88*18*1

WIRE LENGTH METERS	PO4 um/l	Si(OH)4 um/l	NO3 um/l	NO2 um/l
100	.14	1.70	4.34	.05
90	.13	1.60	3.72	.08
80	.16	1.60	3.99	.16
70	.13	1.80	2.73	.12
60	.08	1.40	1.32	.28
50	.08	1.20	1.39	.40
40	.04	.80	.66	.51
30	.02	.40	.14	.09
20	.02	.20	.17	.03
15	.01	.30	.14	.04
10	.04	.30	.46	.11
0	.01	99.99	.09	.03

CRUISE 87L88 STATION B87L88*19*1

WIRE LENGTH METERS	PO4 um/l	Si(OH)4 um/l	NO3 um/l	NO2 um/l
108	.27	3.50	7.22	.03
90	.27	3.00	7.02	.04
80	.24	2.80	6.53	.06
75	.25	2.80	6.50	.06
70	.25	2.60	6.32	.09
60	.13	1.80	4.77	.25
50	.03	.90	.83	.25
40	.03	.70	.07	.20
35	.02	1.00	.06	.05
30	.02	.60	.04	.02
20	100.	.20	.11	.01
10	.03	.20	.22	.02
0	.01	.30	.07	.02

CRUISE 87L88 STATION B87L88*21*1

WIRE LENGTH METERS	PO4 um/l	Si(OH)4 um/l	NO3 um/l	NO2 um/l
108	.27	3.30	7.49	.02
90	.27	2.90	7.08	.03
80	.23	2.30	6.61	.05
75	.15	1.50	3.85	.05
70	.09	1.10	2.38	.06
60	.08	1.60	2.06	.06
50	.08	1.80	1.81	.06
40	.07	1.90	1.51	.07
35	.07	1.20	1.55	.29
30	.04	1.30	.68	.22
20	.01	-99.99	.10	.01
10	.02	.10	.08	.01
0	.03	.10	.26	.03

CRUISE 87L88 STATION B87L88*22*1

WIRE LENGTH METERS	PO4 um/l	Si(OH)4 um/l	NO3 um/l	NO2 um/l
109	.15	2.80	4.34	.02
90	.16	2.40	4.63	.03
75	.16	2.40	4.35	.03
60	.12	2.00	2.93	.04
50	.18	2.40	4.04	.06
45	.09	1.80	1.87	.10
40	.09	1.80	1.94	.15
35	.05	1.40	.73	.27
30	.02	.70	.57	.11
25	.02	.50	.54	.08
20	.01	.40	.54	.06
10	.01	.20	.20	.02
0	.01	.10	.19	.02

CRUISE 87L88 STATION B87L88*23*1

WIRE LENGTH	PO4	Si(OH)4	NO3	NO2
METERS	um/l	um/l	um/l	um/l
108	.22	2.70	6.17	.03
90	.20	2.20	6.02	.03
70	.20	2.30	5.06	.04
60	.17	2.40	3.88	.05
55	.13	1.90	2.70	.07
50	.21	2.20	4.48	.09
40	.18	2.00	3.55	.12
35	.15	1.80	2.88	.26
30	.05	.80	.65	.16
25	100.	.10	[illegible]	.02
20	100.	99.99	.03	.01
10	100.	99.99	.13	.01
0	100.	99.99	.04	.01

CRUISE 87L88 STATION B87L88*24*1

WIRE LENGTH	PO4	Si(OH)4	NO3	NO2
METERS	um/l	um/l	um/l	um/l
105	.20	2.70	6.30	.04
95	.18	2.20	3.26	.13
90	.08	1.20	2.35	.35
85	.13	1.20	3.39	.17
80	.16	1.30	3.22	.20
70	.14	1.40	3.06	.34
60	.15	1.60	2.96	.54
50	.21	2.00	4.33	.13
40	.19	1.70	3.86	.12
30	.11	.90	2.03	.13
20	.01	.10	.05	.03
10	100.	.10	.04	.02
0	.01	99.99	99.99	.03

CRUISE 87L88 STATION B87L88*25*1

WIRE LENGTH	PO4	Si(OH)4	NO3	NO2
METERS	um/l	um/l	um/l	um/l
106	.28	3.20	6.65	100.
100	.26	2.60	5.41	.01
90	.23	2.00	4.99	.01
80	.20	1.60	4.04	.02
70	.17	1.30	3.44	.06
60	.11	.70	1.98	.14
50	.02	99.99	.16	.13
45	.02	99.99	.13	.12
40	.02	.20	.16	.12
30	.02	.10	.13	.10
20	.01	.10	.17	.10
10	.01	.10	.06	.10
0	.01	.10	.14	.11

CRUISE 87L88 STATION B87L88*26*1

WIRE LENGTH	PO4	Si(OH)4	NO3	NO2
METERS	um/l	um/l	um/l	um/l
104	.11	2.20	3.74	100.
100	.13	1.70	3.86	.01
90	.31	3.70	7.44	.01
80	.33	3.90	7.45	100.
75	.27	2.90	5.46	.04
70	.32	3.20	6.63	100.
60	.27	2.20	5.21	.01
50	.25	1.90	4.74	100.
40	.14	1.10	2.35	.14
30	.03	.10	.18	.08
20	.01	99.99	.12	.06
10	.02	.10	99.99	.05
0	.03	.10	.06	.06

CRUISE 87L88 STATION B87L88×27×1

WIRE LENGTH	PO4	Si(OH)4	NO3	NO2
METERS	um/1	um/1	um/1	um71
104	.13	2.20	3.87	100.
90	.11	2.30	2.81	.04
80	.09	2.30	2.54	.05
65	.29	3.70	6.62	.07
60	.32	3.50	6.16	.11
50	.29	2.90	5.39	.09
40	.25	2.60	4.54	.12
35	.20	1.90	3.42	.23
30	.08	.80	.82	.25
20	.04	.40	.13	.17
10	.03	.20	99.99	.13
0	.01	.30	99.99	.12

CRUISE 87L88 STATION B87L86×28×1

WIRE LENGTH	PO4	Si(OH)4	NO3	NO2
METERS	um/1	um/1	um/1	um/1
109	.27	3.60	6.79	.01
~~90~~	~~.30~~	~~3.20~~	~~6.73~~	~~.01~~
80	.28	2.80	6.53	.02
~~70~~	~~.27~~	~~2.60~~	~~6.24~~	~~.02~~
60	.25	2.40	5.32	.02
~~50~~	~~.11~~	~~1.20~~	~~2.38~~	~~.04~~
40	.24	2.30	4.94	.12
~~35~~	~~.19~~	~~2.00~~	~~3.60~~	~~.12~~
30	.16	1.90	1.97	.09
~~25~~	~~.01~~	~~.30~~	~~99.99~~	~~.02~~
20	100.	.10	99.99	100.
~~10~~	~~100.~~	~~.10~~	~~99.99~~	~~100.~~
0	100.	.10	99.99	100.

CRUISE 87L88 STATION B87L88*29*1

WIRE LENGTH METERS	PO4 um/l	Si(OH)4 um/l	NO3 um/l	NO2 um/l
105	.28	2.80	6.67	.03
95	.28	2.70	6.45	.04
90	.29	2.90	6.59	.03
80	.29	2.80	6.54	.04
70	.28	2.70	6.33	.05
60	.25	2.30	5.65	.05
55	.11	1.80	3.60	.07
50	.04	1.00	.44	.12
45	.03	.30	.02	.01
40	.03	.10	.01	.01
35	.02	.20	.02	100.
30	.02	.20	.04	.01
20	.02	.20	.04	.01
10	.03	.20	.04	.01
0	.01	.20	.04	.01

CRUISE 87L88 STATION B87L88*30*1

WIRE LENGTH METERS	PO4 um/l	Si(OH)4 um/l	NO3 um/l	NO2 um/l
109	.18	1.80	3.35	.01
100	.33	2.70	5.15	100.
90	.33	2.80	5.03	.01
80	.31	2.20	4.37	.01
70	.29	1.90	3.95	.01
60	.25	1.50	3.22	.02
55	.22	1.30	3.01	.02
50	.21	1.20	2.73	.03
45	.18	1.10	2.38	.03
40	.12	.70	1.55	.12
35	.03	.30	.31	.09
20	.01	.10	.07	.03
10	.01	.20	.07	.03
0	.01	.20	.06	.03

CRUISE 87L88 STATION B87L88*31*1

WIRE LENGTH	PO4	Si(OH)4	NO3	NO2
METERS	um/l	um/l	um/l	um/l
107	.24	2.10	4.77	.02
100	.24	2.10	4.57	.02
90	.29	2.40	5.02	.02
80	.31	2.50	5.09	.02
70	.30	2.20	4.59	.02
60	.27	2.30	4.21	.02
50	.18	1.40	2.74	.07
45	.10	1.00	1.61	.08
40	.05	.30	.31	.06
35	.05	.20	.10	.04
30	.02	.10	.01	.02
20	.02	.10	.03	.01
10	.02	.10	.02	.01
0	.01	99.99	.02	.01

CRUISE 87L88 STATION B87L88*32*1

WIRE LENGTH	PO4	Si(OH)4	NO3	NO2
METERS	um/l	um/l	um/l	um/l
107	.10	2.60	3.31	.03
90	.14	2.50	4.33	.03
80	.13	2.50	3.64	.03
70	.08	2.30	2.00	.04
65	.06	1.80	.95	.05
60	.04	1.30	.32	.08
55	.07	1.40	1.37	.15
54	.09	1.40	1.82	.15
50	.03	.80	.11	.10
45	.08	1.40	1.55	.11
40	.03	.70	.15	.08
30	.02	.20	.02	.01
20	.02	.10	99.99	100.
10	.01	.10	99.99	100.
0	100.	99.99	.02	.01

CRUISE 87L88 STATION B87L88*33*1

WIRE LENGTH METERS	PO4 um/l	Si(OH)4 um/l	NO3 um/l	NO2 um/l
108	.26	2.70	6.68	.04
90	.24	2.30	6.36	.05
80	.23	2.00	5.66	.06
70	.21	1.60	5.06	.08
60	.23	2.20	5.25	.07
55	.24	2.40	5.14	.06
50	.15	1.70	2.80	.07
45	.13	1.40	2.11	.08
40	.16	1.70	2.58	.09
30	.01	..10	99.99	.01
20	.02	.10	99.99	.01
10	.02	.10	99.99	.01
0	.01	.10	99.99	.01

CRUISE 87L88 STATION B87L88*34*1

WIRE LENGTH METERS	PO4 um/l	Si(OH)4 um/l	NO3 um/l	NO2 um/l
105	.18	2.40	5.35	.03
90	.18	2.10	4.76	.03
80	.11	2.40	2.22	.03
70	.09	2.20	1.32	.04
60	.12	1.70	1.53	.08
55	.11	1.40	1.04	.10
50	.10	1.00	.37	.10
45	.03	.10	.07	.03
35	.03	.10	.06	.03
25	.04	.30	.13	.04
20	.05	.20	.09	.03
10	.04	99.99	99.99	.01
0	.02	99.99	99.99	.01

CRUISE 87L88 STATION B87L88*35*1

WIRE LENGTH	PO4	Si(OH)4	NO3	NO2
METERS	um/l	um/l	um/l	um/l
109	.24	3.30	7.16	.05
100	.26	3.30	7.12	.05
90	.20	3.10	7.06	.05
80	.28	2.90	6.91	.05
70	.26	2.70	6.43	.06
60	.24	2.40	5.78	.07
50	.20	2.00	4.99	.12
40	.14	1.40	3.06	.23
35	.06	.60	.33	.23
30	.04	.20	99.99	.20
25	.03	.40	.01	.10
20	.01	.10	.06	.01
10	.01	.10	.06	.01
0	.01	.10	.06	.01

CRUISE 87L88 STATION B87L88*36*1

WIRE LENGTH	PO4	Si(OH)4	NO3	NO2
METERS	um/l	um/l	um/l	um/l
107	.11	1.80	2.65	.10
100	.28	3.50	6.21	.09
90	.44	4.60	7.81	.09
80	.45	4.00	6.87	.08
70	.46	3.60	6.16	.08
60	.33	2.40	3.64	.12
50	.10	1.20	.30	.08
45	.08	.80	.16	.06
40	.07	.40	.04	.03
30	.08	.50	.03	.02
20	.05	.50	.02	.02
10	.06	.50	.05	.03
0	.06	.50	.04	.03

CRUISE 87L88 STATION B87L88*37*1

WIRE LENGTH METERS	PO4 um/l	Si(OH)4 um/l	NO3 um/l	NO2 um/l
107	.14	1.80	3.33	.05
90	.27	2.70	5.97	.04
80	.29	2.90	6.02	.03
70	.24	2.30	4.78	.03
60	.26	2.60	4.72	.04
50	.07	.70	.19	.06
40	.04	.40	.02	.03
30	.03	.30	99.99	.02
20	.02	.30	99.99	.02
10	.02	.30	99.99	.02
0	.02	.30	99.99	.02

CRUISE 87L88 STATION B87L88*38*1

WIRE LENGTH METERS	PO4 um/l	Si(OH)4 um/l	NO3 um/l	NO2 um/l
108	.23	2.80	6.87	.07
95	.21	2.90	4.59	.06
85	.19	2.30	2.84	.09
80	.15	1.90	1.58	.11
70	.05	.70	99.99	.20
60	100.	.10	99.99	.04
50	100.	.10	99.99	.04
40	.01	.10	99.99	.04
35	.01	.10	99.99	.04
30	.02	.30	99.99	.04
20	.02	.20	.01	.05
10	.02	.20	.01	.04
0	.01	.20	.01	.03

CRUISE 87L88 STATION B87L89*39*1

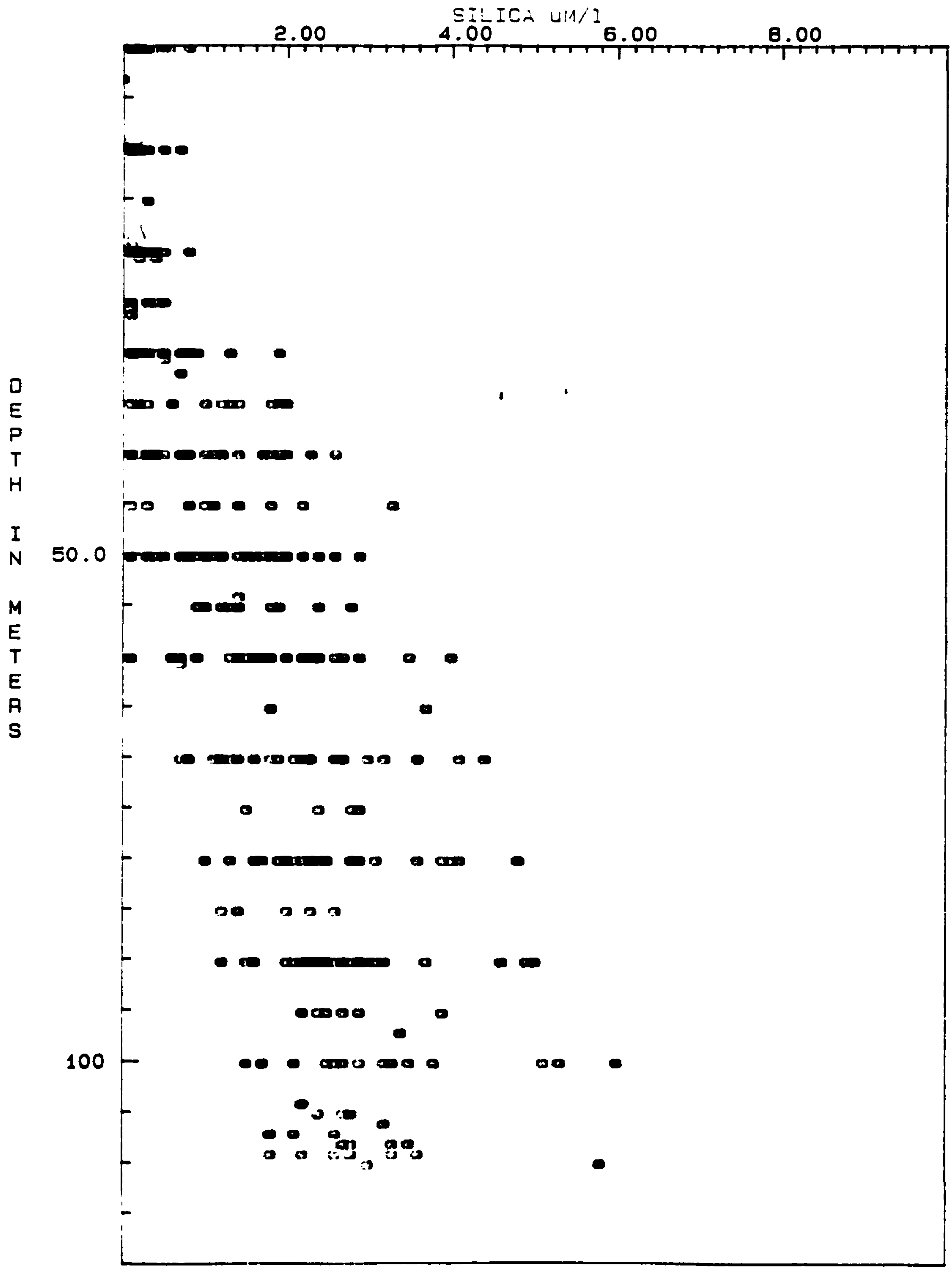
WIRE LENGTH METERS	PO4 um/l	Si(OH)4 um/l	NO3 um/l	NO2 um/l
109	.14	2.20	4.26	.06
95	.11	2.40	2.01	.05
85	.09	2.60	.74	.04
80	.19	2.40	3.60	.04
70	.12	2.30	.65	.04
60	.13	2.40	.72	.07
55	.02	1.00	.01	.03
50	.01	.30	99.99	.03
40	100.	.30	99.99	.03
30	100.	.30	99.99	.03
20	100.	.20	99.99	.02
10	100.	.10	99.99	.02
0	100.	.30	99.99	.03

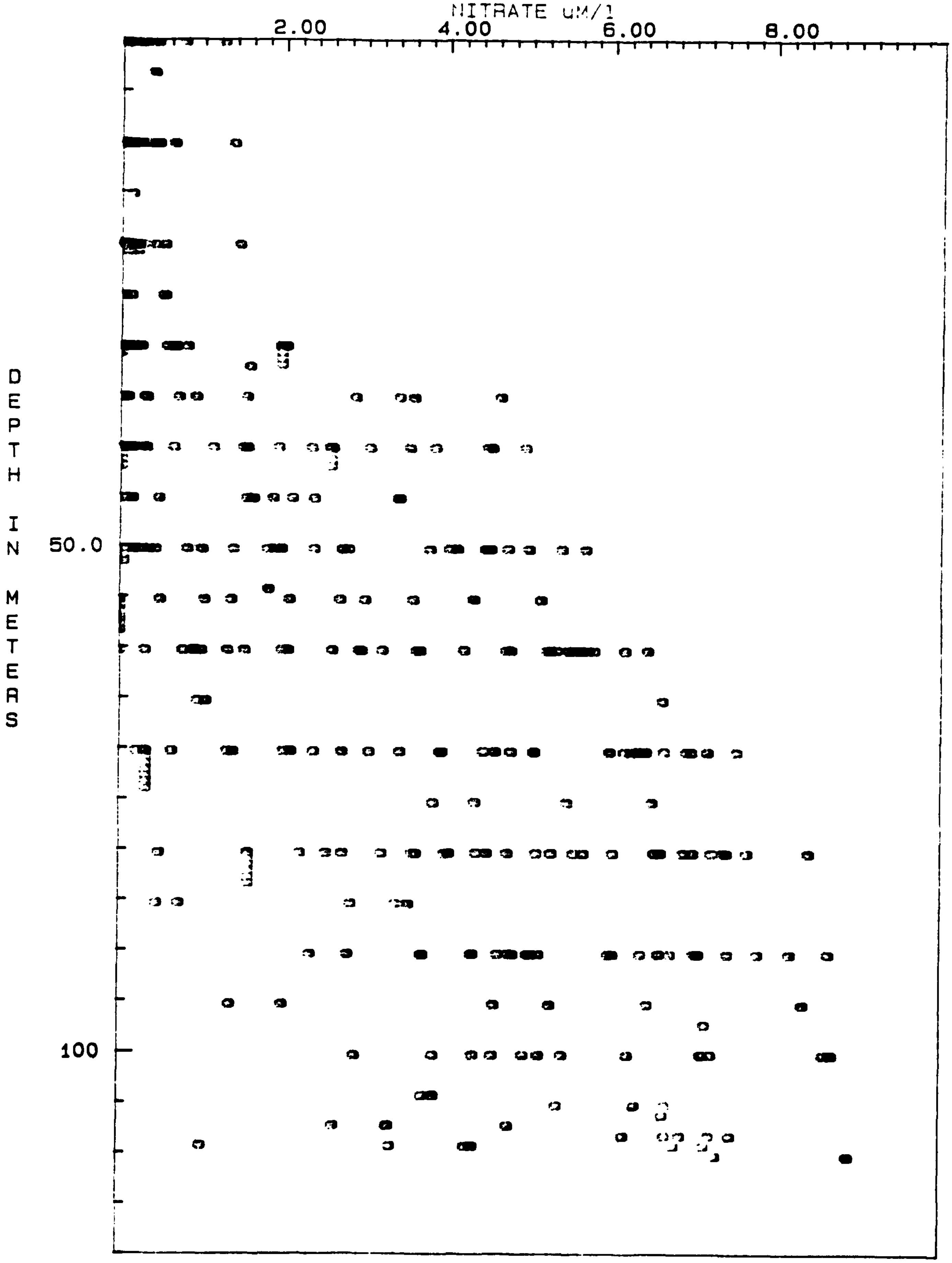
CRUISE 87L88 STATION B87L88*40*1

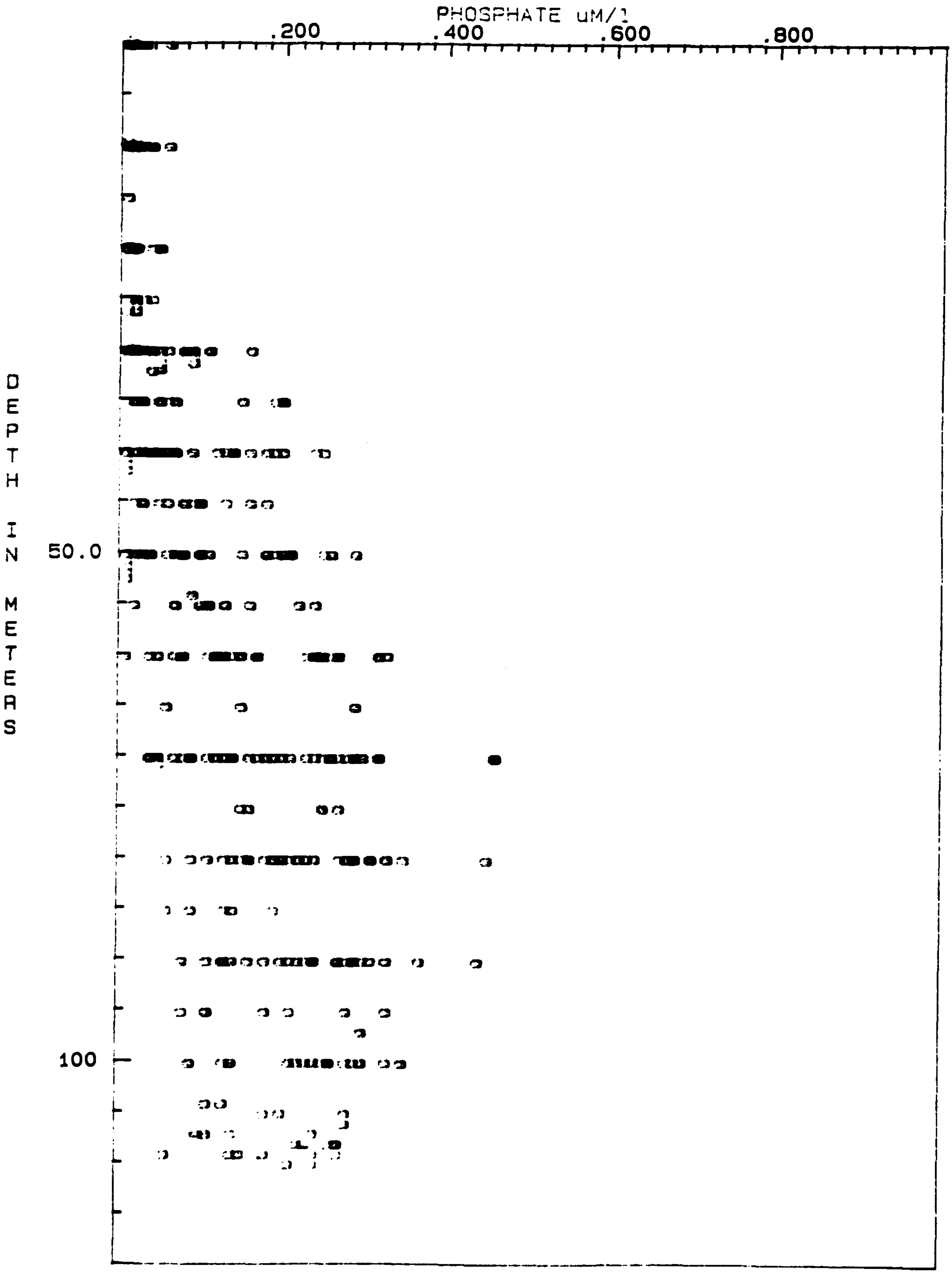
WIRE LENGTH METERS	PO4 um/l	Si(OH)4 um/l	NO3 um/l	NO2 um/l
110	.24	3.00	7.31	.08
100	.25	2.90	7.13	.08
90	.24	2.70	6.59	.08
80	.22	2.10	5.27	.07
70	.23	2.30	4.45	.07
65	.15	1.60	1.45	.05
60	.14	1.70	.90	.08
55	.10	1.20	.50	.10
50	.06	.80	.18	.08
40	.04	.40	.41	.07
30	.06	.20	.02	.03
20	.05	.20	.02	.02
10	.03	99.99	99.99	.01
0	.02	.10	99.99	.01

CRUISE 87L88 STATION B87L88*41*1

WIRE LENGTH METERS	PO4 um/I	Si(OH)4 um/I	NO3 um/I	NO2 um/I
109	.06	2.60	1.03	.06
95	.08	2.50	1.37	.06
85	.06	2.00	.47	.05
80	.06	1.90	.50	.06
70	.04	.80	.33	.19
60	100.	.10	99.99	.02
50	.01	.10	99.99	.02
40	.02	.10	99.99	.01
30	.02	.10	99.99	.02
20	.01	.10	99.99	.01
10	.01	.10	99.99	.01
0	100.	.10	99.99	.01


SILICA uM/l
2.00
4.00
6.00
8.00
DEPTH IN METERS
50.0
100


NITRATE uM/l
2.00
4.00
6.00
8.00
DEPTH IN METERS
50.0
100


PHOSPHATE uM/l
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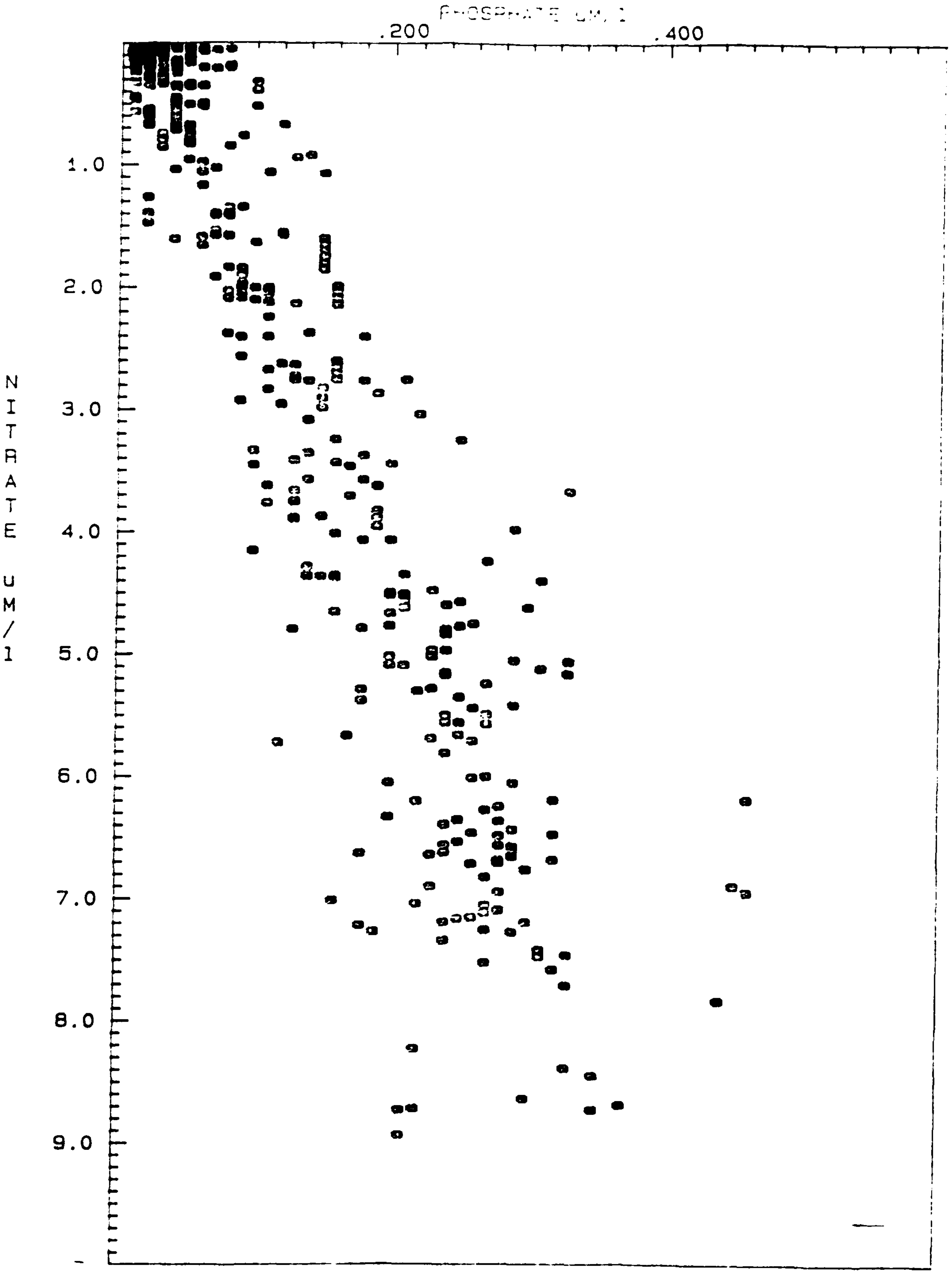
.400
.600
.800
DEPTH IN METERS
50.0
100



PHOSPHATE UM/1
.200
.400
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
NITRATE UM/1

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